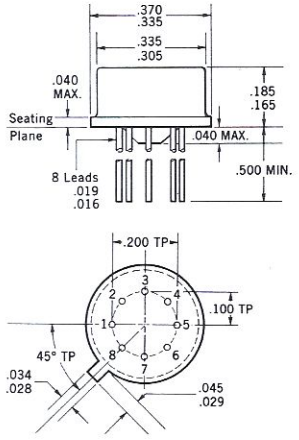
SH3201

ADJUSTABLE NEGATIVE DC VOLTAGE REGULATOR

FAIRCHILD HYBRID CIRCUIT

- **SHORT CIRCUIT PROTECTED**
- **BROAD RANGE OF OUTPUT VOLTAGES . . . —8.5 V TO —30 V**
- **LOAD CURRENTS 0 TO 50 mA AND 5.0 AMPS USING AN EXTERNAL PASS TRANSISTOR**
- **EXCELLENT REGULATION: LINE REGULATION . . . 0.005%/V MAX.**
  LOAD REGULATION . . . 0.05% MAX.
- **APPLICATIONS: SERIES REGULATOR FOR NEGATIVE DC POWER SUPPLIES, DIGITAL AND ANALOG INTEGRATED CIRCUITS**
- **A COMPLEMENT SH3200 OF THIS REGULATOR IS ALSO AVAILABLE FOR POSITIVE VOLTAGE REGULATION**

PHYSICAL DIMENSIONS
in accordance with
JEDEC (TO-99) outline



NOTES:
Dimensions as per latest J-10 committee
All dimensions in inches
Leads are gold-plated Kovar
Package weight is 0.95 grams

PART NO. HXK32011XX

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures	
Storage Temperature	—65°C to +150°C
Operating Temperature	—55°C to +125°C
Maximum Power Dissipation	
at 25°C Free Air Temperature (Note 1)	780 mW
at —55°C to +125°C Case Temperature	1.0 W
Maximum Voltages and Current	
Input Voltage	—35 V
Output Voltage (Note 2)	—28 V
Input-Output Voltage Differential	28 V
Output Current (Note 3)	50 mA

SCHEMATIC DIAGRAM

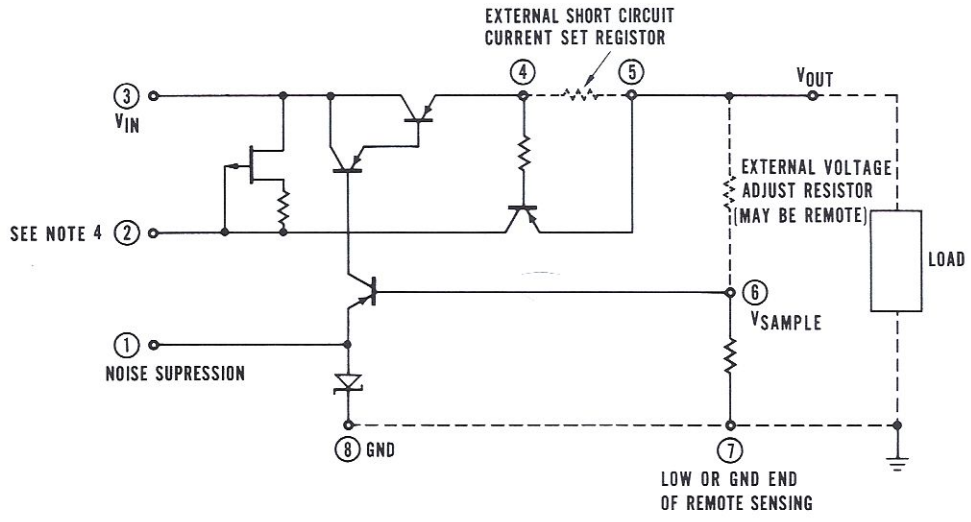


FIGURE 1

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

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FAIRCHILD HYBRID CIRCUIT SH3201

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
V_{IN}	Input Voltage Range	−12.5		−35	Volts	
V_{OUT}	Output Voltage Range (Note 2)	−8.5		−30	Volts	$35\ V \geq \lvert V_{IN}\rvert \geq \lvert V_{OUT}\rvert + 4.0\ V$
$\lvert V_{IN}\text{-}V_{OUT}\rvert$	Input-Output Voltage Differential	4.0		28	Volts	
I_L	Load Current (Note 3)	0		50	mA	
$V_{(NOISE)}$	Uncompensated Output Noise Voltage		30	150	mVp.p.	$8.5\ V \leq \lvert V_{OUT}\rvert \leq 30\ V$ $0 \leq I_L \leq 50\ mA$
$V_{(NOISE)}$	Compensated Output Noise Voltage		3.0	5.0	mVp.p.	$C \geq 0.4\ \mu F$, Pin 1 to Pin 8 $8.5\ V \leq \lvert V_{OUT}\rvert \leq 30\ V$ $0 \leq I_L \leq 50\ mA$
$\frac{\lvert(\Delta V_{OUT}/V_{OUT})\%\rvert}{\Delta V_{IN}}$	Line Regulation		.002	.005	%/V	$35\ V \geq \lvert V_{IN}\rvert \geq \lvert V_{OUT}\rvert + 4.0\ V$
$\frac{\lvert(\Delta V_{OUT}/V_{OUT})\%\rvert}{I_L}$	Load Regulation (I_L = 0 to 50 mA)		.02	.05	%	$\lvert V_{IN}\rvert \geq \lvert V_{OUT}\rvert + 4.0\ V$
$\frac{\lvert(\Delta V_{OUT}/V_{OUT})\%\rvert}{\Delta T}$	Temperature Stability $T_A = -55°C$ to $+125°C$			.01	%/°C	At Package Power Dissipation ≤ 780 mW
$\frac{\lvert(\Delta V_{OUT}/V_{OUT})\%\rvert}{P_D}$	Power Dissipation Stability			.002	%/mW	$4.0\ V \leq \lvert V_{IN} - V_{OUT}\rvert \leq 28\ V$ $0 \leq I_L \leq 50\ mA$

TYPICAL REGULATED OUTPUT VOLTAGE ADJUSTMENT

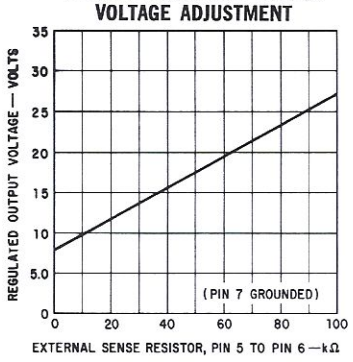

FIGURE 2

TYPICAL SHORT CIRCUIT PROTECTION SETTING CURRENT

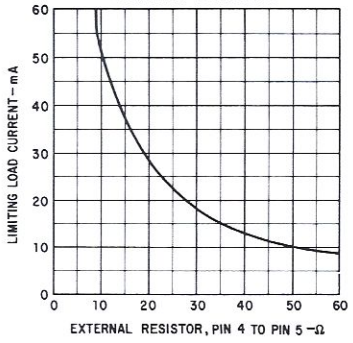

FIGURE 3

MAXIMUM POWER DISSIPATION VERSUS AMBIENT TEMPERATURE

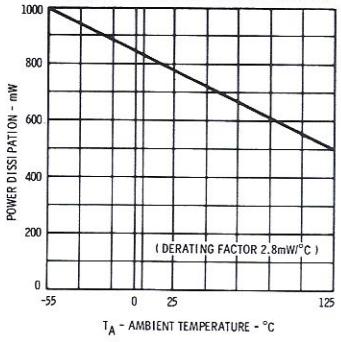

FIGURE 4

NOTES:

(1) Derating factor as shown in Fig. 4 is 2.8 mW/°C.

(2) Selection of Output Voltages: By externally connecting a preselected sense resistor (see figure 2) between pin 5 and pin 6 any desired output voltage in the range of 8.5 V to 30 V is achieved.

(3) Selection of Short Circuit Current: The maximum limit on the internal short circuit protection at any current from 1 to 50 mA can be set by externally connecting a preselected resistor (see figure 3) between pin 4 and pin 5.

(4) This pin is made available for connections to compensating networks which can be used to alter the dynamic response of the regulator to meet unusual load requirements. No connection is necessary for normal operation.

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